Diagnosis of Lower Extremity Paralysis

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Case Study

- A twenty year old man presents complaining of worsening gait difficulty over the last week. He also has had six months of back pain. On ROS, he describes intermittent feverishness, malaise and a 20 pound weight loss.
Case Study

On Exam:

- Moderate weakness of the bilateral hip flexors, knee flexors, and ankle dorsiflexors
- Brisk knee and ankle reflexes
- A sensory level around T-10
- A bony deformity in his lower spine
The most likely diagnosis is:

A. Neoplastic spinal cord compression
B. TB
C. Polio
D. HIV myelopathy
E. Leprosy
Two Questions

1. Where is the lesion located?
2. What is the lesion?
Where is the Lesion?

- Requires understanding of functional neuroanatomy
- Neurological exam is the prime determinant
The Neuraxis

Muscle → N-M junction → Nerve → Plexus → Root

Ant Horn Cell → Cord → Post Fossa → Supra-Tent
<table>
<thead>
<tr>
<th></th>
<th>Muscle</th>
<th>Nerve</th>
<th>Root/ Plexus</th>
<th>Ant Horn Cell</th>
<th>Cord</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor</strong></td>
<td>Proximal Muscles</td>
<td>Distal Muscles</td>
<td>Variable</td>
<td>Variable</td>
<td>Hip, Knee, ankle Flexors</td>
</tr>
<tr>
<td><strong>Sensory</strong></td>
<td>Normal</td>
<td>Distal loss</td>
<td>Variable</td>
<td>Normal</td>
<td>Sensory Level</td>
</tr>
<tr>
<td><strong>Reflexes</strong></td>
<td>Normal to decreased</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td><strong>Tone</strong></td>
<td>Normal</td>
<td>Normal</td>
<td>Flaccid</td>
<td>Flaccid</td>
<td>Spastic</td>
</tr>
</tbody>
</table>
Where is the lesion?

- Focal vs. Multifocal vs. Diffuse
What is the lesion?
What? Involves 2 Questions

1. What is the temporal profile?
   - Onset
   - Evolution
Onset

- Acute---within minutes to hours
- Subacute---within days
- Chronic---within months
Evolution

- **Transient** - Temporary symptoms that have resolved completely
- **Improving** - Symptoms that show evidence of partial resolution
- **Progressive** - Symptoms which continue to increase in severity, or show new symptoms
- **Stationary** - Symptoms which have reached maximum severity and have shown no significant change
What? Involves 2 Questions

2. What is the most likely etiology?

The neurologic differential is very manageable.
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- **The** Trauma
- **Neurologic** Neoplastic
- **Differential** Degenerative/Demyelinating/Developmental
- **Is** Infectious/
- **Very** Inflammatory
- **Manageable** Vascular
- **Toxic/Metabolic**
## Important Temporal and Spatial Features

<table>
<thead>
<tr>
<th></th>
<th>ACUTE</th>
<th>SUBACUTE</th>
<th>CHRONIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOCAL</td>
<td>Vascular Trauma</td>
<td>Inflammatory /Infectious</td>
<td>Neoplasm</td>
</tr>
<tr>
<td>DIFFUSE</td>
<td>Vascular Trauma</td>
<td>Inflammatory /Infectious</td>
<td>Degenerative</td>
</tr>
<tr>
<td></td>
<td>Toxic/Metab</td>
<td>Toxic/Metab</td>
<td>Toxic/Metab</td>
</tr>
</tbody>
</table>
Trauma

- External trauma
- Compressive Trauma
Neoplastic

- Vertebral mets with cord compression
- Intraspinal tumor
- Leptomeningeal cancer
- Paraneoplastic
Degenerative/Demyelinating/Developmental

- Motor Neuron Disease
- Hereditary spastic paraparesis
- Syrinx
- Degenerative disc disease/spondylosis
- Multiple Sclerosis
- Devic’s disease
Infectious/Inflammatory

- Viruses
  - HIV
  - Polio
  - HTLV-1
  - CMV
  - West Nile/Japanese encephalitis
  - Rabies
Infectious/Inflammatory

- Bacteria
  - Brucella
  - Syphilis
  - TB
  - Leprosy
  - Any bacterial abscess

- Helminths
  - Schistosomiasis

- Inflammatory
  - Guillain-Barre
Vascular

- Spinal Cord Infarct
- Spinal AVM
- Vasculitis
Toxic/Metabolic

Nutritional

- B1 (Thiamine)
- B6 (Pyridoxine)
- B12
- Vit E
- Cassava (konzo)
- Chick pea (Lathyris)
Toxic/Metabolic

- Metabolic
  - Diabetes

- Meds/Drugs
  - EtOH
  - HAART
  - INH
  - Chloroquine
  - Metronidazole
  - Nitrofurantoin
Toxic/Metabolic

- Toxins
  - Arsenic
  - Lead
  - Thallium
  - Organophosphates
  - TOCP
  - Methanol
  - Plant Poisons
  - Ciguatera
Work-Up

- History
  - Temporal profile
  - Sensory or Bowel/Bladder deficits?
  - Nutritional history

- Neuro Exam
  - Motor- UMN vs. radicular vs. distal
  - Sensory- Sensory level vs. dermatomal vs. distal
  - Reflexes- Hyper or hyporeflexive
Work-Up

- **General Exam**
  - Chest for TB
  - Abd for Shisto
  - Back for gibbus, trauma, bacterial abscess

- **Ancillary considerations**
  - HIV
  - CXR
  - Spine X-ray
  - ESR
  - Urine for RBC’s
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